

State General Revenue Nonpoint Source Grant Program

***Recreational Use Attainability Analysis
for Aransas Creek***

**TSSWCB Project # 11-52
Revision 0**

Quality Assurance Project Plan

Texas State Soil and Water Conservation Board

**Prepared by
Nueces River Authority
Corpus Christi, Texas**

**Effective Period: From Final Approval through May 31, 2013
with annual updates required**

Questions concerning this quality assurance project plan should be directed to:

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A1 Approval Sheet

Quality Assurance Project Plan (QAPP) for TSSWCB Project 11-52, Recreational Use Attainability Analysis for Aransas Creek.

Texas State Soil and Water Conservation Board (TSSWCB)

Name: Jana Lloyd

Title: TSSWCB Project Manager (PM)

Signature: _____ Date: _____

Name: Pamela Casebolt

Title: TSSWCB Quality Assurance Officer (QAO)

Signature: _____ Date: _____

Nueces River Authority

Name: Sam Sugarek

Title: Director of Water Quality Programs (PM/QAO)

Signature: _____ Date: _____

Name: Beth Almaraz

Title: Aquatic Resource Specialist

Signature: _____ Date: _____

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List of Acronyms

BMP	Best Management Practice
CAFO	Confined Animal Feeding Operation
CAR	Corrective Action Report
CBD	Coastal Bend Division
COC	Chain of Custody
CRP	Texas Clean Rivers Program
CWA	federal Clean Water Act
DMRG	TCEQ Data Management Reference Guide
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
GPS	Global Positioning System
NRA	Nueces River Authority
PM	Project Manager
QA	Quality Assurance
QAM	Quality Assurance Manual
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
QPR	Quarterly Progress Report
RUAA	Recreational Use Attainability Analysis
SOP	Standard Operating Procedure
SWQM	Surface Water Quality Monitoring
TCEQ	Texas Commission on Environmental Quality
TMDL	Total Maximum Daily Load
TSSWCB	Texas State Soil and Water Conservation Board
TSWQS	Texas Surface Water Quality Standards
WPP	Watershed Protection Plan
WWTF	Wastewater Treatment Facility

A3 Distribution List

Organizations, and individuals within, which will receive copies of the approved QAPP and any subsequent revisions include:

Texas State Soil and Water Conservation Board (TSSWCB)

PO Box 658

Temple, TX 76503

Name: Jana Lloyd

Title: TSSWCB PM

Name: Pamela Casebolt

Title: TSSWCB QAO

Nueces River Authority (NRA)

400 Mann Street, Suite 1002

Corpus Christi, TX 78401

Name: Sam Sugarek

Title: Director of Water Quality Programs

Name: Beth Almaraz

Title: Aquatic Resource Specialist

A4 Project/Task Organization

The following is a list of individuals and organizations participating in the project with their specific roles and responsibilities:

TSSWCB

Jana Lloyd

TSSWCB PM

Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with project. Develops lines of communication and working relationships between NRA and TSSWCB. Tracks deliverables to ensure that tasks are completed as specified in the contract. Responsible for ensuring that the project deliverables are submitted on time and are of acceptable quality and quantity to achieve project objectives. Participates in the development, approval, implementation, and maintenance of the QAPP. Assists the TSSWCB QAO in technical review of the QAPP. Responsible for verifying that the QAPP is followed by project participants. Notifies the TSSWCB QAO of particular circumstances that may adversely affect the quality of data derived from the collection and analysis of samples. Enforces corrective action.

Pamela Casebolt

TSSWCB QAO

Reviews and approves QAPP and any amendments or revisions and ensures distribution of approved/revised QAPPs to TSSWCB and project participants. Responsible for verifying that the QAPP is followed by project participants. Determines that the project meets the requirements for planning, quality assurance (QA), quality control (QC), and reporting. Monitors implementation of corrective actions. Coordinates or conducts audits of field and laboratory systems and procedures.

NRA

Sam Sugarek

NRA PM

Responsible for all project activities and tasks. Responsible for project administration. Develops and maintains relationships with landowners and stakeholders. Ensures tasks and other requirements in the contract are executed on time and are of acceptable quality. Monitors and assesses the quality of work. Coordinates attendance at conference calls, training, meetings, and related project activities with the TSSWCB. Responsible for verifying the QAPP is followed and the project is producing data of known and acceptable quality. Complies with corrective action requirements.

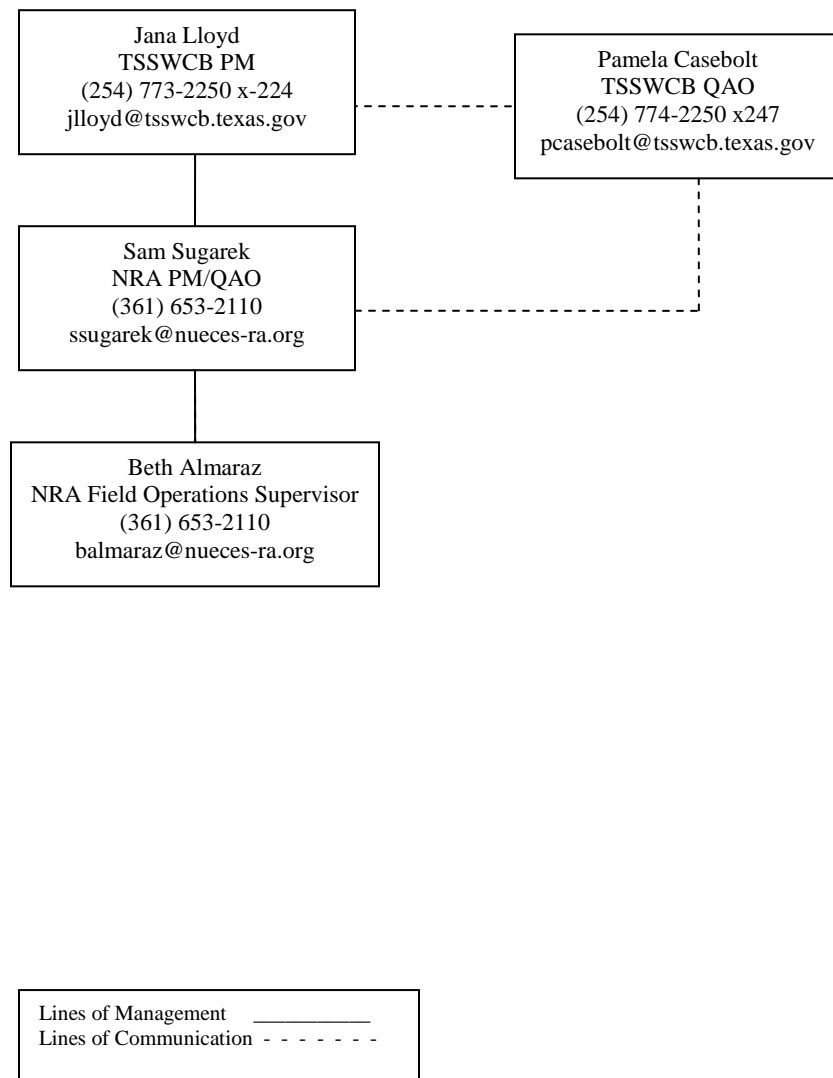
Responsible for coordinating development and implementation of the QA program. Responsible for writing and maintaining the QAPP. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for coordinating with the TSSWCB QAO to resolve QA- related issues.

Beth Almaraz

NRA Field Operations Manager

Responsible for supervising all aspects of the measurements and data collection for surface water and other RUAA information in the field. Responsible for the acquisition of field data measurements in a timely manner that meet the quality objectives specified in Section A7 (Table A.1), as well as the requirements of Sections B1 through B8. Responsible for field scheduling, staffing, and ensuring that staff is appropriately trained as specified in Sections A6 and A8.

Figure A4.1 Organization Chart – Lines of Communication



A5 Problem Definition/Background

Aransas Creek reaches 20 miles from the confluence of the Aransas River northeast of Skidmore to the headwaters of the stream west of Beeville. The Aransas Creek watershed is largely rural ranchland. Tributaries to Aransas Creek include Dry Creek, Elm Creek, and Olmos Creek. There are six road crossings including La Para Ranch Road, Gill Ranch Road, US 59, FM 1349, FM 888, and US 181. Currently, there are no active water quality monitoring stations, stream flow gauges, or wastewater treatment facility (WWTF) outfalls on this segment. However, TSSWCB and NRA collected and submitted biased flow data to TCEQ at station 20066 between 2007 and 2010 for TSSWCB project 06-15, *Surface Water Quality Monitoring to Support Development and Implementation of Bacteria TMDLs in the Copano Bay Watershed*. In addition, 24-hour DO monitoring is being conducted by NRA at station 12941.

Aransas Creek is located in Bee County basically southwest of the City of Beeville. The land adjacent to Aransas Creek reflects the rural nature of the watershed with a scrub and shrub riparian zone of consistent width existing along almost its entire length and cultivated fields, improved pasture and range outside the riparian zone.

The TCEQ and TSSWCB established a joint technical Task Force on Bacteria TMDLs in September 2006 charged with making recommendations on cost-effective and time-efficient bacteria TMDL development methodologies. The Task Force recommended the use of a three-tier approach that is designed to be scientifically credible and accountable to watershed stakeholders. The tiers move through increasingly aggressive levels of data collection and analysis in order to achieve stakeholder consensus on needed load reductions and strategies to achieve those reductions. In June 2007, the TCEQ and TSSWCB adopted the principles and general process recommended by the Task Force. Fundamental in the three-tier approach is ensuring that the appropriate water quality standard (i.e., designated use) is applied to the waterbody before initiating any watershed planning activity (e.g., TMDL or WPP).

Major revisions to the Texas Surface Water Quality Standards (TSWQS) were adopted by the TCEQ Commission on June 30, 2010 and became effective as state rule on July 22, 2010. The recently adopted revisions include modifications to contact recreation use and bacteria criteria. As part of this revised process, TCEQ has developed procedures for conducting Recreational Use Attainability Analyses (RUAAs). In order for a new category of recreational use or a different bacteria water quality standard to be applied to a waterbody, a RUAA will need to be conducted. TCEQ and TSSWCB have collaborated on developing a list of priority waterbodies for collecting information needed for RUAAs; Aransas Creek is on that list.

Segment 2004A is not supporting the primary contact recreation use due to excessive bacteria, and has been above the geometric mean for *E. coli* concentrations since the 2006 assessment. Aransas Creek was assessed in 2010 as having a geometric mean *E. coli* concentration of 390 cfu/100 mL. The geometric mean falls between the criterion for primary contact recreation (126 cfu/100 mL) and secondary contact recreation 1 (630 cfu/100 mL) in the recently adopted revisions to the TSWQS.

In accordance with the *Memorandum of Agreement between the TCEQ and the TSSWCB Regarding TMDLs, Implementation Plans, and Watershed Protection Plans*, the TSSWCB has agreed to take the lead role in conducting an RUAA in the study area. TSSWCB and NRA will work with local stakeholders to progress through the data collection and analysis components of a RUAA and at the end of this project have adequate data that either supports the existing designated use (primary contact recreation) or supports a change in designated use (secondary contact recreation).

A6 Project/Task Description

This project consists of performing a Comprehensive RUAA on Aransas Creek (Segment 2004A) for the purpose of ascertaining the level of recreational use occurring in the creek. This project will adhere to the procedures provided in the *TCEQ Procedures for a Comprehensive RUAA and a Basic RUAA Survey*.

This Comprehensive RUAA of Aransas Creek consists of 3 main tasks: a) conducting the required two surveys of Aransas Creek, b) public participation and stakeholder interaction and c) evaluation of historical bacterial water quality data and survey of possible bacteria sources.

Using GIS inventory and current land use classification, NRA will identify sites, with the help of stakeholders, for RUAA data collection. Sites will be located in areas where the waterbody is accessible to the public and have the highest potential for recreational use (primary contact). The sites will be well-spaced and, where practical, distributed such that there are 3 sites for every 5 miles of stream. Table B1.1 indicates site locations.

NRA will conduct field surveys at selected sites during the period people would most likely be using the waterbody for contact recreation; surveys shall ascertain the suitability of the streams for contact recreation use and shall document the hydrological characteristics of the stream. Two field surveys will be conducted at each site. Each survey will be performed at a time of year and under weather and hydrologic conditions conducive to observing recreational use on Aransas Creek, which means when air temperatures are warm to hot (>70° F). The surveys should be performed during the period people would most likely be using the waterbody for contact recreation, typically March to October (e.g., spring break, summer, holidays, and weekends). A historical information review will be conducted on recreation use that occurred on Aransas Creek on and after November 28, 1975.

Each survey will be conducted per the most recently applicable TCEQ RUAA guidance and will include collection of transect information along a stretch of the creek at each site, a stream flow measurement where possible, numerous physical observations, bank access, stream substrate, and collection of survey information from individuals either actively recreating at each site or knowledgeable of the site and Aransas Creek, in general. Information to be collected shall at least satisfy those questions found on the Field Data Sheet in Appendix C.

NRA shall document and describe the antecedent rainfall conditions (approximately 30 days prior to fieldwork) at each selected site.

NRA will collect a digital photographic record of each selected site during the field surveys. Photographs should clearly depict the entire channel. A photograph will be taken at each measured transect. Evidence of observed uses or indications of human use as well as evidence of non-use will be chronicled. Photographs will include upstream, left and right bank, and downstream views at the top (300m), middle (150m), and bottom (30m) transect of each reach. Obstructions, stream color, water surface characteristics, stream trash and observed evidence of wildlife (tracks or fecal material) will be included in the photographic record of each site.

NRA will design and conduct a watershed source survey that better characterizes the possible sources of bacteria loadings. Local stakeholders and technical experts will be consulted in the development of the source survey, which will represent warm and cool seasons and low and high flow conditions. Locations of possible bacteria sources identified during the source survey will be incorporated into the GIS inventory.

In the interest of generating complete descriptions of all project waterbodies, it is the intent of TSSWCB to fully complete RUAA surveys on waterbodies where obvious primary contact recreation occurs or that may be at other than baseflow conditions. This protocol deviates from the guidance in the *TCEQ Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (June 2010) which suggests terminating the survey when such conditions are encountered.

NRA will facilitate public education and stakeholder interaction. Stakeholder interaction will help in obtaining landowner permission for access to sites along Aransas Creek and ensuring that decision-making regarding the RUAA is founded on local input. A public meeting will be held where the RUAA process is described and solicitation is made for access to the waterbody. Direct interaction with affected city councils, county commissioner's courts, and SWCDs will occur. Any necessary follow-up meetings will be conducted to further communicate the RUAA process and to obtain landowner permission for access to the creek. A final public meeting will be conducted to present findings of the RUAA surveys.

Pertinent tasks from the project contract are provided below.

Task	Project Milestones	Agency	Start Month	End Month
3.1	Conduct at least one reconnaissance trip to assess potential survey sites. The reconnaissance trip(s) will be a follow-up on the interaction with landowners under Task 4. The goal will be to have approximately 3 sites per 5 miles of river (approximately 12 sites) of which 2 sites will be at the two public access points (road crossings).	NRA	1	4
3.2	Utilizing information from subtask 5.1 (comprehensive GIS inventory), subtask 3.1 (reconnaissance trip), Task 4 (public input), and other relevant information, NRA will identify sites for RUAA data collection. Proposed sites should be located in areas where the waterbody is accessible to the public and has the highest potential for recreational use (primary contact). Because public access is limited along this waterbody, other sites will also be selected for the purpose of characterizing the physical characteristics of the stream to assist in determining the potential level of recreation use that can be supported. The sites should be well-spaced and, in general, distributed such that there are 3 sites for every 5 miles of stream.	NRA	1	5
3.3	Conduct a thorough historical information review of the recreational uses of the waterbody back to November 28, 1975. Historical resources that should be examined include, but are not limited to, photographic evidence, local newspapers, museum collections, published reports, historical society records, and long-term landowners/residents. Texas Parks and Wildlife Department and commercial providers of outdoor recreation goods and services should be consulted for historical information.	NRA	1	24
3.4	Conduct 2 field surveys at each site during a normal warm season (air temperature $\geq 70^{\circ}\text{F}$) and baseflow conditions (sustained or typical dry, warm-weather flows between rainfall events, excluding unusual antecedent conditions of drought or wet weather), when people would most likely be using the waterbody for contact recreation, typically March to October (e.g., spring break, summer, holidays or weekends). To ascertain the suitability of the streams for contact recreation use, field surveys shall document hydrological characteristics of the stream, such as width and depth of channel and substantial pools, flow/discharge, air/stream temperature, bank access, and stream substrate. Information to be collected shall at least satisfy those questions found on the Field Data Sheet from the latest version of the <i>TCEQ Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey</i> . Document and describe antecedent (prior to fieldwork) rainfall conditions (approximately the previous 30 days) at each selected site.	NRA	4	24

3.5	Collect a digital photographic record of each selected site during the field surveys. Photographs shall include upstream, left and right bank, and downstream views. Any evidence of observed uses or indications of human use shall be photographed. Photographs should clearly depict the entire channel and each transect measured.	NRA	4	24
3.6	In order to obtain information on existing and historical uses and stream characteristics, NRA shall conduct interviews of 1) users present during the field surveys, 2) streamside landowners along the field survey transects, 3) local residents, and 4) commercial providers of outdoor recreation goods and services. Surveys shall include at least those questions found on the Interview Form in the latest version of the <i>TCEQ Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey</i> .	NRA	1	24
3.7	Combine findings from historical information review, field surveys, and user interviews into a Technical Report that shall at least include those contents described for a Comprehensive RUAA in the latest version of the <i>TCEQ Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey</i>	NRA	14	24
4.1	Facilitate public participation activities and coordinate stakeholder involvement in the project. NRA will develop (Months 1-2) and maintain (Months 3-24) a list of stakeholders likely to be affected by this project.	NRA	1	24
4.2	Provide logistical support for public meetings, including, but not limited to, securing meeting facilities, preparing/disseminating meeting notices and agendas, and preparing meeting summaries. At a minimum, public stakeholder meetings shall consist of an initial public meeting (Month 11), a source survey design meeting (Month 4), a project update meeting (Month 20), and a meeting presenting final Technical Reports (Month 16). A primary objective of the public meetings is to solicit landowner permission for private-land access to Mid Pecan Bayou for survey sites.	NRA	1	24
4.3	NRA, as appropriate, will attend and participate in other public meetings, including, but not limited to, city council meetings, county commissioners' court meetings, SWCD meetings, and NRA Clean Rivers Program (CRP) Steering Committee and Coordinated Monitoring meetings, in order to communicate project goals, activities, and accomplishments to affected parties.	NRA	1	24
4.4	NRA will develop and disseminate educational materials to watershed stakeholders, including, but not limited to, flyers, brochures, letters, and news releases. NRA will include project updates in the CRP Basin Summary Report and/or Basin Highlights Report. TSSWCB will host and maintain a webpage to serve as a public clearinghouse for all project-related information; NRA will provide content matter for the webpage. The website will serve as a means to disseminate information to stakeholders and the general public.	NRA	1	24
5.1	Develop a comprehensive GIS inventory for the study area. Data should include the most recent information available on land use/land cover classification, elevation, soils, stream networks, reservoirs, roads, public parklands, municipalities and satellite imagery or aerial photography. Locations of TCEQ SWQM stations, USGS gages, public access points to the waterbodies, floodwater-retarding structures, wetlands, TPDES permittees (including WWTFs, CAFOs and MS4s), and subdivisions should also be included. Sites permitted for land application of sewage sludge and septage should be included. Locations of possible bacteria sources, identified in Subtask 5.3, should be incorporated. The cumulative impact of TSSWCB-certified WQMPs on the management of agricultural and silvicultural lands should be documented.	NRA	1	12
5.2	Conduct a historical data review for the waterbody in order to assess and characterize trends and variability in water quality, specifically bacteria. Historical data collection activities should concentrate on 1) ambient water quality data; 2) streamflow and water level data; 3) precipitation records; and 4) permitted facilities, discharges, and effluent quality. At a minimum, U.S. Geological Survey (USGS), National Weather Service (NWS), Texas Parks and Wildlife Department (TPWD), Texas Water Development Board (TWDB), TCEQ, and EPA should be queried for data related to the study area.	NRA	1	18
5.3	Facilitate a meeting of local stakeholders and technical experts to design a source survey (also known as a sanitary survey) that better characterizes the possible sources of bacteria loadings. The source survey should be developed so that it represents warm and cool seasons and low and high flow conditions. The source survey should evaluate sources like WWTFs, central sewage collection systems, OSSFs, and MS4s. TPDES compliance issues should be examined. Wildlife, livestock and non-domestic animal populations should be examined. The source survey should draw from the pollutant loading model developed for TCEQ for use in the Copano Bay TMDL. Technical experts should include at least one representative, as appropriate to their jurisdiction and interest, from TPWD, Texas Department of Agriculture (TDA), TCEQ, Texas AgriLife Extension Service, Texas Forest Service (TFS), USGS, U.S. Fish and Wildlife Service (USFWS), USDA Natural Resources Conservation Service (USDA-NRCS), USDA Agricultural Research Service (USDA-ARS), LCRA, and affected municipalities, counties and SWCDs.	NRA	1	10

A7 Quality Objectives and Criteria

The project objective is to collect data that may be used to support decisions related to recreational use designation. Data to be collected in the RUAA surveys at each site are listed in *Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey*. The types of measurement data to be collected for this project are listed in Table A7.1.

Table A7.1 Measurement Performance Specifications

Parameter	Units	Matrix	Method ¹	Parameter Code	AWRL	(LOQ)	Rec. at LOQ (%)	Precision LCS/LCSD (%RPD) ²	Rec. of LCS	Responsible Entity
Temperature, Water	°C	Water	EPA 170.1 & TCEQ SOP	00010	NA	NA	NA	NA	NA	NRA Field
Temperature, Air	°C	Air	EPA 170.1 & TCEQ SOP	00020	NA	NA	NA	NA	NA	NRA Field
Flow	cfs	Water	TCEQ SOP	00061	NA	NA	NA	NA	NA	NRA Field
Flow Measurement Method	1-gage 2-electric 3-mechanical 4-weir/flume 5doppler	Water	TCEQ SOP	89835	NA	NA	NA	NA	NA	NRA Field

1. *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods*, most current version.

Precision

Precision is the degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves. It is a measure of agreement among replicate measurements of the same property, under prescribed similar conditions, and is an indication of random error. Instrument precision will be assured by proper use, maintenance, and calibration of flow meters and thermometers in accordance with manufacturer specifications.

Bias

Bias is a statistical measurement of correctness and includes components of systemic error. A measurement is considered unbiased when the value reported does not differ from the true value. Bias in instrument measurements will be addressed through training in instrument use to assure consistency within and between field teams.

Representativeness

Representativeness is a measure of how accurately a monitoring program reflects actual water quality conditions and recreational uses. The representativeness of the data is dependent on the sampling locations, the conditions under which surveys are performed, and the survey procedures.

The RUAA surveys will ideally be performed at a frequency of three sites per five stream miles to assure maximum capture of stream recreational uses. Additionally, sites will be surveyed preferentially during high recreational use potential, both temporally and hydrologically. Representativeness will be measured with the completion of data collected in accordance with the approved QAPP.

Comparability

Confidence in the comparability of data sets from this project and those for similar uses is based on the commitment of NRA to use only the methods and QA/QC protocols prescribed in the *Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey* in accordance with quality system requirements and as described in this QAPP.

Completeness

The completeness of the data is basically a function of weather, site access, and the availability and willingness of individual responders. Ideally, 100% of the data should be available. Unavailable data due to weather and the inability to access the sites and interview individuals are to be expected. Therefore, it will be a general goal of the project that 90% data completion is achieved. Interviewing the required contacts, completing the field data sheets and interview forms for each site, and providing the required photographic evidence, maps, and final report will guarantee the completeness of the each data set.

A8 SPECIAL TRAINING/CERTIFICATION

Field personnel will receive training in proper field analysis. Before actual field measurements occur, field personnel will demonstrate to the NRA QAO or designee their ability to properly calibrate field equipment and perform field analysis procedures. Training will be documented and retained in the NRA Monitoring Staff Training file and be available during a monitoring systems audit.

Personnel collecting Global Positioning System (GPS) data have training and certification obtained by 1) completing an agency training class, 2) completing a suitable training class offered by an outside vendor, or 3) by providing documentation of sufficient GPS expertise and experience.

A9 Documents and Records

Quarterly progress reports (QPRs) will note activities conducted in connection with the RUAA, items or areas identified as potential problems, and any variations or supplements to the QAPP. Corrective Action Reports (CARs) will be utilized when necessary. CARs that result in any changes or variations from the QAPP will be made known to pertinent project personnel and documented in an update or amendment to the QAPP. All QPR and QAPP revisions will be distributed to personnel listed in Section A3.

The TSSWCB may elect to take possession of records at the conclusion of the specified retention period.

RUAA Reports and Forms

- Information to be collected shall at least satisfy those questions found on Contact Information Form (Appendix C)
- Field Data Sheets, Interview Forms, and RUAA Summary in electronic format
- Digital photographic record, cataloged in an appropriate manner

Records and Documents Retention Requirements

<u>Document/Record</u>	<u>Location at NRA</u>	<u>Retention</u>	<u>Form</u>
QAPP, amendments, and appendices	CBD 5 years	Paper	
QAPP distribution documentation	CBD	5 years	Paper/Electronic
Training records	CBD	5 years	Paper
Field notebooks or field data sheets	CBD	5 years	Paper/Electronic
Field equipment calibration/maintenance logs	CBD	5 years	Paper
RUAA Contact Information, Field Data, And Interview Forms	CBD	5 years	Paper/Electronic
Field SOPs	CBD	5 years	Paper/Electronic
Corrective action documentation	CBD	5 years	Paper/Electronic

QAPP Revision and Amendments

Until the work described is completed, this QAPP shall be revised as necessary and reissued annually on the anniversary date, or revised and reissued within 120 days of significant changes, whichever is sooner. The last approved versions of QAPPs shall remain in effect until revised versions have been fully approved; the revision must be submitted to the TSSWCB for approval at least 30 days before the last approved version expires. If the entire QAPP is current, valid, and accurately reflects the project goals and the organization's policy, the annual re-issuance may be done by a certification that the plan is current. This can be accomplished by submitting a cover letter stating the status of the QAPP and a copy of new, signed approval pages for the QAPP.

Amendments to the QAPP may be necessary to reflect changes in project organization, tasks, schedules, objectives and methods; address deficiencies and non-conformances; improve operational efficiency; and/or accommodate unique or unanticipated circumstances. Requests or amendments are directed from the NRA PM to the TSSWCB PM in writing. The changes are effective immediately upon approval by the TSSWCB PM and QAO, or their designees.

Amendments to the QAPP and the reasons for the changes will be documented, and copies of the approved QAPP Expedited Amendment form will be distributed to all individuals on the QAPP distribution list by the NRA PM. Amendments shall be reviewed, approved, and incorporated into a revised QAPP during the next revision of the QAPP.

B1 Sampling Process Design (Experimental Design)

NRA will collect information that can be used to evaluate recreational uses in the study area. Methods used and sampling process design shall be consistent with the TCEQ *Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (2009). NRA will conduct field surveys at selected sites during periods people would most likely use the waterbody for contact recreation; surveys shall ascertain the suitability of the streams for contact recreation use and shall document the hydrological characteristics of the stream.

Field data will be collected following procedures detailed in *TCEQ SWQM Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2008* (RG-415).

Aransas Creek (Segment 2004A), located in Bee County, is approximately 20 miles long and is comprised of one assessment unit (2004A_01), indicates a goal of 12 sites (3 site per 5 miles of stream). Currently, 9 stations are proposed for the RUAA; 6 stations are publically accessible via road crossings and 3 are located on private property. On average, there is one site for every 3.65 km (2.27 miles) of stream.

Much of the access along Aransas Creek is only via private property, the majority of which is held in fairly large land holdings, often bordered with high game fences or barbed wire. There is a small community located downstream of the road crossing at FM 888 (ACK 02) where approximately 50 houses exist on both sides of the creek. Landowners throughout the watershed with property adjacent to the creek were contacted regarding access to Aransas Creek for potential RUAA sites. Additionally, a public meeting was held on May 29, 2012 in Skidmore to discuss the RUAA and proposed sites. Although several landowners have allowed access to their property for this RUAA survey, there are several large gaps between stations where access is only via private property and to which landowners have denied or not permitted access.

The individuals contacted were from a list generated by staff at Nueces River Authority (NRA). Staff worked off Bee County records to determine landowners along Aransas Creek. Close to 80 people with property along Segment 2004A were contacted. Of those who denied access to their property, some were not interested in helping the government. Some thought the project was trying to promote aquatic recreation on the creek and therefore increase public access to private property. Each time a contact name and phone number was left, if there was not an answer, and from several there was never a return phone call, which was noted on the contact list. Some attempts were also made to contact landowners directly by stopping by houses that appeared near the creek, if the house was accessible (i.e., not gated). At one site (ACK 04), permission was acquired as a result of this.

Public access to Aransas Creek is limited to 6 road crossings located at US 181, FM 888, FM 1349, US 59, Gill Ranch Road, and La Para Road, many of which are bordered by fences. The creek is only truly accessible downstream of FM 888 (ACK 02) and downstream of US 181 (ACK 05) where there are no fences at present. NRA has accessed these 2 crossings and noted at least 300 meters of accessible creek. At the other four road crossings (ACK 06 – ACK 09), accessibility is limited to the area adjacent to the bridge crossing; landowner permission has been obtained to conduct surveys beyond the fence line. The other three stations (ACK 01, ACK 03, and ACK 04) are located on private property; landowner permission has been granted to access these stations. There are no other publicly accessible areas with potential for recreational use directly along the segment.

The average distance between survey sites is 3.65 km (2.27 miles) and ranges from 0.80 km (0.48 mi) to 6.32 km (3.93 mi). The largest gap of 6.32 creek km occurs between survey stations ACK 02 and ACK 03. There is no suitable public access to the Aransas Creek along this stretch without accessing private property, of which, landowner access has not been granted. Several smaller gaps are located between ACK 06, and ACK 07 (5.28 km) and between ACK 07 and ACK 08 (6.15 km) in the upper end of the watershed where the stream is more ephemeral in nature.

The proposed RUAA sites include 2 out of the 2 existing monitoring stations in TCEQ's SWQMIS along the mainstem of Aransas Creek. There are no permitted WWTFs, CAFOs, or TLAPs within the Aransas Creek watershed.

Table B1.1 provides the sites selected for use in the project. Sites are identified according to map legend and, where applicable, TCEQ Station ID.

Sites are listed in upstream to downstream order

TCEQ ID (if collocated)	Map Legend	Site Description	Latitude	Longitude	Distance to Previous Station (km)	Distance from Upper Segment Boundary (km)	Distance from Lower Segment Boundary (km)	Private or Public Access	Private Access Landowner Approved
---	---	SEGMENT & AU01 upper boundary at headwaters of the stream about 10 km upstream of US 59	---	---	0.00	0.00	32.88	---	---
---	ACk09	Aransas Creek at La Para Road	28.397500	-97.865600	3.63	3.63	29.25	Public	Yes
---	ACk08	Aransas Creek at Gill Ranch Road	28.391100	-97.864800	0.80	4.43	28.45	Public	Yes
---	ACk07	Aransas Creek at US 59	28.346300	-97.837100	6.15	10.58	22.30	Public	Yes
---	ACk06	Aransas Creek at FM 1349	28.322700	-97.806500	5.28	15.86	17.02	Public	Yes
20066	ACk05	Aransas Creek at FM 888	28.308000	-97.770000	4.56	20.42	12.46	Public	Yes
---	ACk04	Aransas Creek downstream of FM 888	28.302000	-97.764300	0.88	21.30	11.58	Private	Yes
---	ACk03	Aransas Creek midway between US 181 and FM 888	28.302000	-97.739100	3.01	24.31	8.57	Private	Yes
12941	ACk02	Aransas Creek at US 181	28.276900	-97.691800	6.32	30.63	2.25	Public	Yes
---	ACk01	Aransas Creek downstream of US 181	28.280000	-97.675000	1.97	32.60	0.28	Private	Yes
---	---	SEGMENT & AU01 lower boundary at confluence with Poesta Creek and Aransas River	---	---	0.28	32.88	0.00	---	---

B2 Sampling Methods

Field Sampling Procedures

The sampling process design will be based on the *Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey*. Field measurements will be made according to procedures documented in the *TCEQ SWQM Procedures Volume 1: Physical and Chemical Monitoring Methods, 2008 (RG-415)*. Water temperature will be measured using calibrated YSI 600 XLM multiprobes. Air temperature will be measured using hand-held field thermometers. Instantaneous water velocity measurements (flow) will be measured using SonTek Flow Tracker™ Acoustic Doppler Velocimeter.

For the RUAA field surveys, information to be collected shall at least satisfy those questions found on the Field Data Sheet from the *TCEQ Procedures for a Comprehensive RUAA and a Basic RUAA Survey*.

Documentation of Field Sampling Activities

Field sampling activities are documented on the Field Data Sheet – Basic RUAA Survey (Appendix C). For all visits, station ID, location, time, date, and sample collector's name/signature are recorded. Values for all measured field parameters are recorded. Detailed observational data are recorded including water appearance, weather, biological activity, stream uses, unusual odors, specific sample information, missing parameters.

The following will be recorded for all visits:

1. Station ID
2. Date and time
3. Location
6. Data collector's name/signature
7. Values for measured field parameters
8. Detailed observational data, including:
 - a. water appearance
 - b. unusual weather conditions
 - c. apparent biological activity
 - d. unusual odors, if applicable
 - e. pertinent observations related to water quality or stream uses (e.g., exceptionally poor water quality conditions/standards not met; stream uses such as swimming, boating, fishing, irrigation pumps, etc.)
 - f. watershed or instream activities (events impacting water quality, e.g., bridge construction, livestock watering upstream, etc.)
 - g. missing data (when scheduled data are not collected)

Field activities for recreational use attainability tasks shall at least satisfy those questions found on the Field Data Sheets, Interview Forms, and RUAA Summary Sheet as specified in Appendix C.

Recording Data

For the purposes of this section and subsequent sections, all personnel follow the basic rules for recording information as documented below:

1. Legible writing in indelible, waterproof ink with no modifications, write-over's or cross-outs;
2. Changes should be made by crossing out original entries with a single line, entering the changes, and initialing and dating the corrections.
3. Close-outs on incomplete pages with an initialed and dated diagonal line.

Deficiencies, Nonconformances and Corrective Action Related to Sampling Requirements

Deficiencies are defined as unauthorized deviation from procedures documented in the QAPP. Nonconformances are deficiencies which affect quality and render the data unacceptable or indeterminate. Deficiencies related to sampling method requirements include, but are not limited to, such things as sonde calibration and sample site adjustments.

Deficiencies are documented in logbooks, field data sheets, etc. by field staff and reported to the NRA Field Operations Manager who will notify the NRA PM/QAO within 24 hours. The NRA staff member identifying the deficiency will initiate a record on the Deficiency Worksheet to document the deficiency.

The NRA PM/QAO (and other affected individuals/organizations), will determine if the deficiency constitutes a nonconformance. If it is determined the activity or item in question does not affect data quality and therefore is not a valid nonconformance, the deficiency worksheet will be completed accordingly. If it is determined a nonconformance does exist, the NRA PM/QAO will determine the disposition of the nonconforming activity or item and necessary corrective action(s); results will be documented by the NRA PM/QAO by completion of a Corrective Action Report (CAR).

CARs document: root cause(s); programmatic impact(s); specific corrective action(s) to address the deficiency; action(s) to prevent recurrence; individual(s) responsible for each action; the timetable for completion of each action; and, the means by which completion of each corrective action will be documented. CARs will be included with quarterly progress reports. In addition, significant conditions (i.e., situations which, if uncorrected, could have a serious effect on safety or on the validity or integrity of data) will be reported to the TSSWCB immediately both verbally and in writing.

B3 SAMPLE HANDLING AND CUSTODY

Sample Handling

Sample parameters for this project are recorded *in situ*. No physical samples are collected, so this section is not applicable.

B4 ANALYTICAL METHODS

Failures in Measurement Systems and Corrective Actions

Failures in field measurement systems involve, but are not limited to, such things as instrument malfunctions, failures in calibration, etc. In many cases, the field technician will be able to correct the problem. If the problem is resolvable by the field technician, then they will document the problem on the field data sheet and complete the measurement. If the problem is not resolvable, then it is conveyed to the NRA PM/QAO through initiation of a CAR. The nature and disposition of the problem is reported to the NRA PM/QAO, who will include this information in the CAR and submit with the QPR to the TSSWCB PM.

B5 QUALITY CONTROL

Sample parameters for this project are recorded *in situ*. No physical samples are collected, so this section is not applicable.

B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

All sampling equipment testing and maintenance requirements are detailed in the TCEQ *Surface Water Quality Monitoring Procedures, Volume 1*. Field equipment is inspected and tested upon receipt and is assured appropriate for use. Acceptance criteria are detailed in the NRA's quality assurance manual. Equipment records are kept on all field equipment and are available for inspection by the TSSWCB. A supply of critical spare parts is maintained by the NRA Field Supervisor, or designee.

B7 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Field equipment calibration requirements are contained in the TCEQ *Surface Water Quality Monitoring Procedures, Volume 1*.

B8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

All new batches of field supplies are inspected before use to ensure that they are adequate.

B9 Non-direct Measurements

In addition to the data generated from the RUAA associated with this project, non-direct measurements will be acquired from the following tasks:

- A comprehensive GIS inventory of the study area. Data should include the most recent information available on land use/land cover classification, elevation, soils, stream networks, reservoirs, roads, public parklands, municipalities and satellite imagery or aerial photography. Locations of TCEQ SWQM stations, USGS gages, public access points to the waterbodies, floodwater-retarding structures, wetlands, TPDES permittees (including WWTFs, CAFOs and MS4s), and subdivisions should also be included. Sites permitted for land application of sewage sludge and septage should be included. Locations of possible bacteria sources, identified in Subtask 5.3, should be incorporated. The cumulative impact of TSSWCB-certified WQMPs on the management of agricultural and silvicultural lands should be documented.
- Reconnaissance trip(s) to assess potential survey sites.
- Public meetings for solicitation of landowner permission for access to survey sites.
- Historical information review of recreational uses of the waterbody since November 1975. Historical resources that should be included, but are not limited to, photographic evidence, local newspapers, museum collections, published reports, historical society records, and long-term landowners/residents. TPWD and commercial providers of outdoor recreation goods and services should be consulted for historical information.
- Historical data review for Aransas Creek in order to assess and characterize trends and variability in water quality, specifically bacteria. Historical data collection activities should concentrate on 1) ambient water quality data; 2) streamflow and water level data; 3) precipitation records; and 4) permitted facilities, discharges, and effluent quality. At a minimum, USGS, NWS, TPWD, TWDB, TCEQ, and EPA should be queried for data related to the study area.

B10 Data Management

NRA will collect, store electronically, and make all collected project data available to the TSSWCB PM. NRA will also be responsible for maintaining backup files to protect the data. Data will be stored, managed and submitted to TSSWCB through NRA's PM. RUAA data will not go into TCEQ's Surface Water Quality Monitoring Information System (SWQMIS) database. The data will be accompanied by other deliverables, such as a final RUAA report. Deliverables will be submitted to the TSSWCB as described in the contract.

NRA's recordkeeping and document control procedures are contained in the NRA QAM. Original field data sheets are stored in the main office of the NRA Field Staff.

NRA will complete Field Data Sheets for the Basic RUAA, Contact Information Forms, and Comprehensive RUAA Interview Forms by hand on hard copies or as electronic forms on a computer. Information on the forms will be entered into electronic versions at the NRA office in a directory specifically designated for the project that is backed up incrementally every evening and completely once a week. A NRA staff member other than the person who electronically entered the data will review at least 10 percent of the survey information in the database against the original hard copies. NRA staff members will enter data electronically onto the RUAA Summary Sheet into the project directory. Photographs will be taken according to guidelines in the Procedures for a Comprehensive RUAA and a Basic RUAA Survey. The photographs will be taken by an electronic camera and stored in a jpg format in the project directory.

Hardware and Software Requirements

Hardware configurations are sufficient to run Microsoft Access 2003 under the Windows Server 2003 operating system in a networked environment. Information resources staff is responsible for assuring hardware configurations meet the requirements for running current and future data management/database software as well as providing technical support. Software development and database administration are also the responsibility of the information resources department. Information resources develop applications based on user requests and assure full system compatibility prior to implementation.

C1 Assessments and Response Actions

Table C1.1 Assessments and Response Actions

Assessment Activity	Approximate Schedule	Responsible Party	Scope	Response Requirements
Status Monitoring Oversight, etc.	Continuous	NRA Project Manager	Monitoring of the project status and records to ensure requirements are being fulfilled.	Report to TSSWCB in Quarterly Progress Reports
Monitoring Systems Audit	At least once per life of the project; dates to be determined by TSSWCB	TSSWCB QAO	The assessment will be tailored in accordance with objectives needed to assure compliance with the QAPP. Field measurement; facility review; and data management as they relate to the project	30 days to respond in writing to the TSSWCB to address corrective actions
Monitoring Systems Audit	Based on work plan and/or discretion of NRA	NRA QAO	The assessment will be tailored in accordance with objectives needed to assure compliance with the QAPP. Field measurement; facility review; and data management as they relate to the project	30 days to respond in writing to the NRA QAO to address corrective actions

Corrective Action

The NRA PM/QAO is responsible for implementing and tracking corrective action procedures as a result of audit findings. Records of audit findings and corrective actions are maintained by both the TSSWCB PM and the NRA PM/QAO. Audit reports and corrective action documentation will be submitted to the TSSWCB with the Quarterly Progress Report.

If audit findings and corrective actions cannot be resolved, then the authority and responsibility for terminating work is specified in the TSSWCB QMP and in agreements or contracts between participating organizations.

C2 Reports to Management

Reports to TSSWCB Project Management

All reports detailed in this section are contract deliverables that will be transferred from NRA and to TSSWCB in accordance with contract requirements. NRA will have final responsibility for all reports and any draft reports.

Quarterly Progress Report – Summarizes the NRA activities for each task; reports problems, delays, and corrective actions; and outlines the status of each task's deliverables.

Final Project Report – Summarizes NRA activities for the entire project period including a description and documentation of major project activities; evaluation of the project results and environmental benefits:

- Electronic copies of completed interview forms, field data sheets, flow sheets, and RUAA summary sheet;
- Digital photographic record, cataloged for appropriate identification; and
- Technical Report summarizing historical information review, field surveys, and user interviews; Technical Report shall at least include those contents described for a Comprehensive RUAA in the TCEQ *Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (2009).

D1 Data Review, Verification, and Validation

The NRA PM will review the data collected during each RUAA survey for completeness and accuracy as described in Section D2. All measurement data will be verified and validated at the Project level.

D2 Verification and Validation Methods

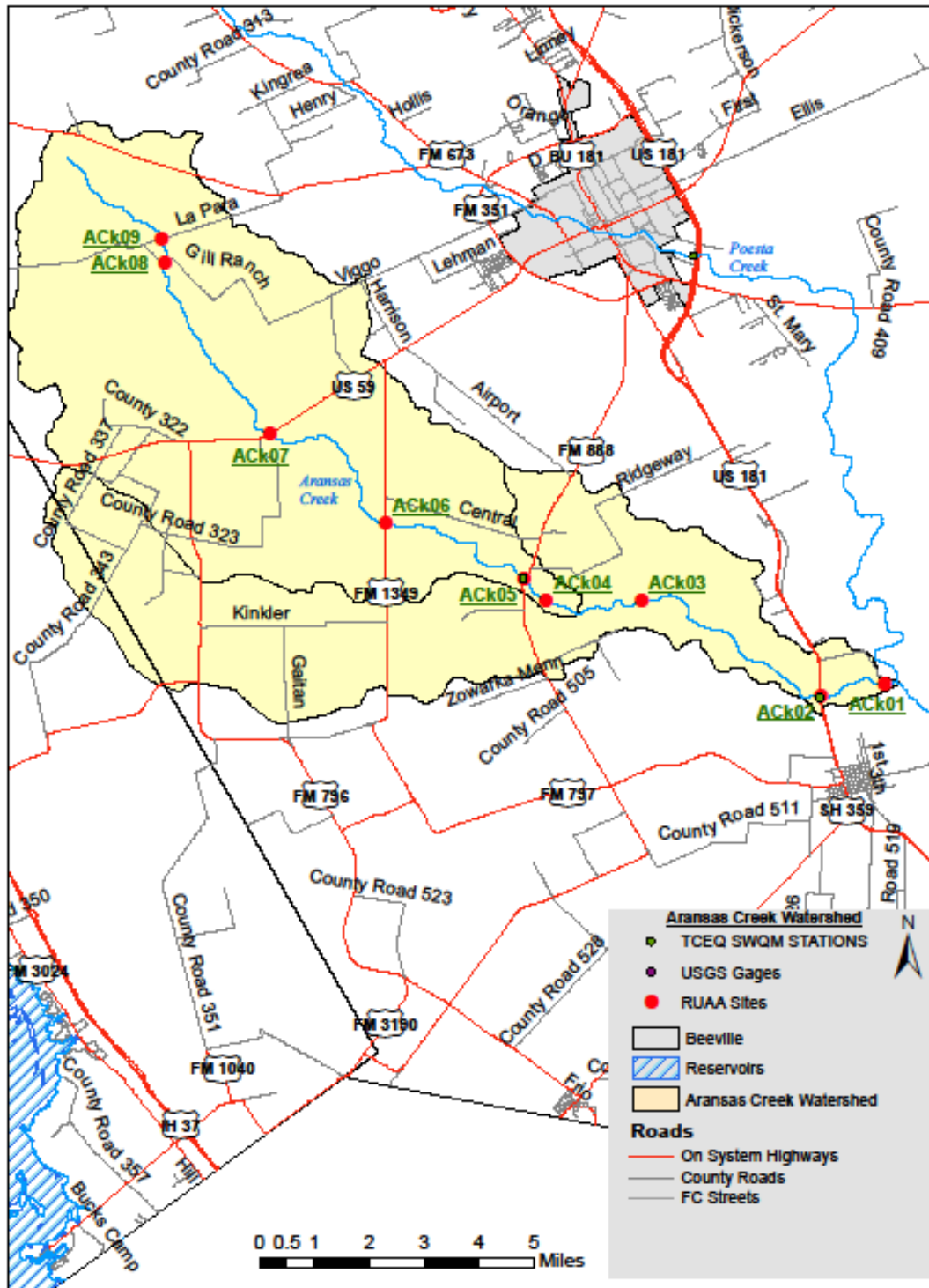
The NRA PM is responsible for reviewing surveys for completeness and accuracy. At least 10% of measurement data in the final, electronic RUAA field data sheets and interview forms should be verified for accuracy against the original handwritten values in field notebooks, field data sheets and interview forms.

D3 Reconciliation with User Requirements

The overall goal of the project is to collect data that provide stakeholders and agencies with sufficient information to determine recreational use status throughout Aransas Creek.

Appendix A: Maps of Area Location and RUAA Stations

Aransas Creek Watershed



Flow Measurements and Estimates

Appendix B: Flow Measurement Standard Operating Procedure

Flow Measurements and Estimates

Aquatic Resource Specialist

Date

Quality Assurance Officer

Date

Nueces River Authority

Effective Period: _1-Jun-2011_____ to __31-May-2013_____

Flow Measurements and Estimates

1.0 Applicability

This procedure applies to stream flow measurements taken at all sampling sites under study by the Nueces River Authority (NRA).

2.0 Purpose

The purpose of this procedure is to establish guidelines for the uniform collection of streamflow data using the SonTek FlowTracker Handheld Acoustic Doppler Velocimeter (ADV).

3.0 Definitions

- 3.1 SonTek Flowtracker handheld ADV unit – an acoustic Doppler Velocimeter that attaches to a rod to measure depth and velocity while wading across a water body.

- 4.0 Equipment, Calibration & Maintenance** – all maintenance and calibrations are performed according to manufacturer's specifications.

- 4.1 SonTek Flowtracker handheld ADV unit

5.0 Procedure

- 5.1 When using the FlowTracker Handheld ADV unit with USGS wading rod, measurements are still taken in varying or one foot increments across the stream cross section.
- 5.1.1 The wading rod is placed on the stream bottom and the total stream depth is measured using the staff gage on the rod. Where water depths are greater than 2.5 feet, velocities are measured at two-tenths and eight-tenths of the stream depth as the average of these equals the mean velocity in the vertical. Where water depths are less than 2.5 feet, a single velocity at six-tenths depth can be used to approximate the mean in the vertical section.
- 5.1.2 After determining the depth and the appropriate method, use the depth chart to determine where to place the flowtracker probe.
- 5.1.2.1 Turn on the Flowtracker handheld and press the Enter key.
- 5.1.2.2 Press 3: Start Data Run.
- 5.1.2.3 Press 1 and input the appropriate site name. If the site file already exists, you will also need to input an extension name.
- 5.1.2.4 Press 9 to accept the name.
- 5.1.2.5 Press 1 and input the beginning flowmeter depth as the staff ht..
- 5.1.2.6 Press next station

Flow Measurements and Estimates

- 5.1.2.7 Press the set location key and input the edge of the water tagline reading.
- 5.1.2.8 Press the set depth key and input a depth of 0.
- 5.1.2.9 Press the next station key.
- 5.1.2.10 Input the appropriate location tagline reading.
- 5.1.2.11 Input the appropriate depth and press enter.
- 5.1.2.12 Press the measure key and wait.
- 5.1.2.13 Press enter.
- 5.1.2.14 Press 1 and accept the reading.
- 5.1.2.15 Repeat steps 5.7.2.10 through 5.7.2.13 until you get to the opposite edge of the stream. When reaching the opposite edge, press the end section key.
- 5.1.2.16 Input the appropriate location and depth.
- 5.1.2.17 Using the previous station key, toggle back to the beginning until you see the gauge ht screen. Input the ending flowmeter depth as the gauge ht.
- 5.1.2.18 Use the next station key until you get to the ending edge screen.
- 5.1.2.19 Press the calculate Discharge key to calculate the flow.
- 5.1.2.20 Press the 9 key to exit.
- 5.1.2.21 Turn the Flowtracker handheld unit off and place it back in the carrying case.
- 5.1.2.22 Fill out all the appropriate information on the Flowtracker flow measurement sheet.

Appendix C: RUAA Contact Information, Field Data, Interview and Summary Forms

Contact Information Form

(This form must be completed prior to conducting a Basic RUAA Survey and/or Comprehensive RUAA.)

The TCEQ Water Quality Standards Group will not consider or review a RUAA unless the appropriate entities listed below have been notified prior to the beginning of a RUAA. A RUAA should not be conducted until you have received a Notice to Proceed from the TCEQ Water Quality Standards Group.

River or stream name: Aransas Creek (Segment 2004A)

Required Local Contacts:

Ask the contacts if a recreational use-attainability analysis is appropriate for the river or stream and check Yes or No below. Document the name of the person contacted and the date they were notified about the proposed RUAA project.

Clean Rivers Program Partner
(River Authority and other local partners) ☒ Yes ☐ No Date Notified: 06/01/2011
Name: Rocky Freund (performing entity)

Texas Parks and Wildlife Department region staff ☒ Yes ☐ No Date Notified: 02/08/2012
Name: Alex Nunez

TCEQ region staff ☒ Yes ☐ No Date Notified: 03/22/2012
Name: Kelly Ruble, Region 14

Texas State Soil and Water Conservation Board
Statewide Resource Management Group ☒ Yes ☐ No Date Notified: 06/01/2011
srm-team@tsswcb.state.tx.us Name: Aaron Wendt (funding entity)

Suggested Additional Local Contacts:

If contacted, ask the contacts if a recreational use-attainability analysis is appropriate for the river or stream and check Yes or No below. If contacted, include information regarding notification date and person contacted on a separate page and attach it to this form.

Local Parks and Recreation Departments	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Municipal Government/Jurisdiction	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
County Government/Jurisdiction	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Local Recreation Groups	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input checked="" type="checkbox"/> Entity Not in Project Area
Conservation Groups	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Local Soil and Water Conservation Districts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Texas AgriLife Extension Service Extension Agent)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area (local County
USDA Natural Resources Conservation Service	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area (local field staff)
Watershed Groups	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input checked="" type="checkbox"/> Entity Not in Project Area
Long-term Landowners/Adjacent Landowners	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Texas Stream Team (formerly Texas Watch)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input checked="" type="checkbox"/> Entity Not in Project Area
Canoe Clubs	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input checked="" type="checkbox"/> Entity Not in Project Area
City Commissioners Office	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Real estate agents	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Local non-profits	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
City/county offices Law Enforcement)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area (Engineer, Health,
Flood control districts	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input checked="" type="checkbox"/> Entity Not in Project Area
Councils of Governments	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Texas Parks and Wildlife Department Game Warden	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area
Other: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Entity Not Contacted <input type="checkbox"/> Entity Not in Project Area

Draft Definitions (2010 TSWQS Revision)

- Primary contact recreation: Water recreation activities, such as wading by children, swimming, water skiing, diving, tubing, surfing, and whitewater kayaking, canoeing, and rafting, involving a significant risk of ingestion of water.
- Secondary contact recreation 1: Water recreation activities, such as fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, not involving a significant risk of water ingestion and that commonly occur.
- Secondary contact recreation 2: Water recreation activities, such as fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, not involving a significant risk of water ingestion but that occur less frequently than for secondary contact recreation 1 due to (1) physical characteristics of the waterbody and/or (2) limited public access.
- Noncontact recreation: Activities, such as ship and barge traffic, birding, and using hike and bike trails near a waterbody, not involving a significant risk of water ingestion, and where primary and secondary contact recreation should not occur because of unsafe conditions.

Information from Local Contacts:

1. If any entity answered no, please list the reason(s) why:

2. Did the local entities confirm that primary contact recreation activities frequently occur? ☐ Yes ☒ No

Please describe how often the activities occur? ☐ Unknown ☐ Never ☐ Daily ☐ Monthly ☐ Yearly

If no, explain: The general consensus is that the creek does not sustain adequate flow to support primary contact recreation under normal conditions.

3. Did the local entities confirm that secondary contact recreation 1 activities frequently occur? ☒ Yes ☐ No

Please describe how often the activities occur? ☒ Unknown ☐ Never ☐ Daily ☐ Monthly ☐ Yearly

If no, explain: If there is adequate flow, fishing is known to occur.

4. Did the local entities confirm that secondary contact recreation 2 activities frequently occur? ☒ Yes ☐ No

Please describe how often the activities occur? ☒ Unknown ☐ Never ☐ Daily ☐ Monthly ☐ Yearly

If no, explain: If there is adequate flow, fishing is known to occur.

5. Did the local entities confirm that noncontact recreation activities frequently occur? ☐ Yes ☒ No

Please describe how often the activities occur? ☐ Unknown ☐ Never ☐ Daily ☐ Monthly ☐ Yearly

If no, explain: No one was aware of any noncontact recreation occurring in the area.

6. Do the local entities know if this waterbody provides substantial flow to a waterbody with primary contact recreation activities (e.g., swimming in a state/local park) or a bathing beach that is located immediately downstream? ☐ Yes ☒ No ☐ Unknown

If yes, have the local entities provide the name of the waterbody and a description of the location of the primary contact recreation uses or bathing beach.

Notify TCEQ Water Quality Standards Group (required):

Send an e-mail notification to the TCEQ Water Quality Standards Group at standards@tceq.state.tx.us.

Notified: ☐ Yes ☐ No

Date Notified by e-mail: _____

Date TCEQ WQS e-mail Response Received: _____

WQS Group Contact Person Providing Response: _____

Did the WQS Group provide a Notice to Proceed with the RUAA? ☐ Yes ☐ No

Additional Local Contacts Made:

Name: Fred Diaz
Entity: Bee County, Parks & Recreation
Date Notified: 05/04/2012

Name: Jimmy Martinez
Entity: City of Beeville
Date Notified: 05/04/2012

Name: Kenneth Haggard
Entity: Bee County, Commissioner Pct 4
Date Notified: 05/25/2012

Name: Dr. Liz Smith
Entity: International Crane Foundation
Date Notified: 06/06/2012

Name: Arturo Gaitan
Entity: Bee SWCD #344
Date Notified: 09/19/2011

Name: Matthew Bochat
Entity: Texas Agrlife Extension Service – Bee County
Date Notified: 05/04/2012

Name: Sha Thomas
Entity: USDA NRCS – Bee County
Date Notified: 09/19/2011

Name: Yvonne Younts
Entity: Local landowner
Date Notified: 06/06/2012

Name: Jeff Heldenfels
Entity: Local landowner
Date Notified: 06/06/2012

Name: Peggy Sue Mican
Entity: Local landowner
Date Notified: 02/24/2011

Name: Patrick May
Entity: Local landowner
Date Notified: 09/23/2011

Name: Dan Breaux
Entity: Local landowner
Date Notified: 10/25/2011

Name: Sherriff Carlos Carrizales
Entity: Bee County, Sherriff
Date Notified: 05/04/2012

Name: Malcolm McDonald
Entity: TPWD Game Warden – Bee County
Date Notified: 03/12/2012

Name: Jace Tunnell
Entity: Coastal Bend Bays and Estuaries Program
Date Notified: 04/14/2012

Field Data Sheets – Basic RUAA Survey
(to be completed for each site)

Data Collectors & Contact Information:	
Date & Time:	County Name:
Stream Name:	
Segment No. or nearest downstream Segment No.:	
Description of Site:	

A. Stream Characteristics:

- Check the following channel flow status that applies.
☐ dry ☐ no flow ☐ low ☐ normal ☐ high ☐ flooded
- Check the following stream type that applies on the day of the survey:
 - ☐ Ephemeral: A stream which flows only during or immediately after a rainfall event, and contains no refuge pools capable of sustaining a viable community of aquatic organisms.
 - ☐ Intermittent: A stream which has a period of zero flow for at least one week during most years. Where flow records are available, a stream with a 7Q2 flow of less than 0.1 cubic feet per second is considered intermittent.
 - ☐ Intermittent w/ perennial pools: An intermittent stream which maintains persistent pools even when flow in the stream is less than 0.1 cubic feet per second.
 - ☐ Perennial: A stream which flows continuously throughout the year. Perennial streams have a 7Q2 equal to or greater than 0.1 cubic feet per second.
 - ☐ Designated or unclassified tidal stream: A stream that is tidally influenced. If you checked this box, you will need to contact the Water Quality Standards Group and evaluate whether or not a bathing beach is located along the tidal stream and whether or not a bathing beach is located along the estuary, bay or Gulf water that the tidal stream flows into.

- Streamflow
 Use USGS gage data (if a gage is located at a site or within a quarter mile of a site) or use the Stream Flow (Discharge) Measurement Form and follow the procedures outlined in the most recent TCEQ Surface Water Quality Monitoring Procedures, Volume 1, RG-415. If USGS gage data is used for a site, include that information as an attachment and list the streamflow on the sampling date below. If the stream flow taken at one site is representative of the flow at another site(s), then that flow can be used as the observed flow and should be documented below. If the stream flow measured at one site is different from another site, then stream flow should be taken at both sites.
 _____ cfs

- Water Quality Data (Field Parameters)
Field parameters should be collected in accordance with the procedures outlined in the most recent TCEQ Surface Water Quality Monitoring Procedures, Volume 1.
 Air Temp: _____ °C Water Temp: _____ °C

- Riparian Zone (Mark dominant categories with L (Left Bank) and R (Right Bank). Bank orientation is determined by the investigator facing downstream.)

_____ Forest	_____ Urban	_____ Rip rap
_____ Shrub dominated corridor	_____ Pasture	_____ Concrete
_____ Herbaceous marsh	_____ Row crops	Other (specify): _____
_____ Mowed/maintained corridor	_____ Denuded/Eroded bank	

- Ease of bank access to the water body: ☐ Easy ☐ Moderately easy ☐ Moderately difficult ☐ Difficult

- Please describe access opportunities or explain why the site is not easily accessible (Attach photos for documentation):

- Dominant Primary Substrate
☐ Cobble ☐ Sand ☐ Silt ☐ Mud/Clay ☐ Gravel ☐ Bedrock ☐ Rip rap ☐ Concrete

Field Data Sheets – Basic RUAA Survey

Stream Name: _____ Site: _____
Date: _____ Time: _____

B. Primary Contact Water Recreation Evaluation:

- Primary contact recreation draft definition: Water recreation activities, such as wading by children, swimming, water skiing, diving, tubing, surfing, and whitewater kayaking, canoeing, and rafting, involving a significant risk of ingestion of water.

1. Were water recreation activities that involve a significant risk of ingestion (full body immersion) observed at this site? ☐ Yes ☐ No primary contact recreation activities were observed

- a. Check the following boxes of primary contact recreation activities observed at the time of the sampling event at the site (Attach photos of the activities or lack of activities).

- ☐ Wading-Children ☐ Tubing ☐ No primary contact activities that commonly occur were observed
☐ Wading-Adults ☐ Surfing ☐ Swimming ☐ Whitewater-kayaking, canoeing, rafting
☐ Water skiing ☐ Diving ☐ Other: _____
☐ frequent public swimming-created by publicly owned land or commercial operations

- b. Check the number of individuals observed at the site: ☐ None ☐ 1-10 ☐ 11-20 ☐ 20-50 ☐ >50

- c. Check the following that apply regarding the individuals proximity to the water body.

- ☐ Water in mouth or nose of the individual
☐ Primary touch: Individual's body (or portion) immersed in water
☐ Secondary touch: fishing, pets and related contact with water
☐ Individual is in a boat touching water
☐ Individual is on shore near water within 8 meters (25ft) of water
☐ Individual is well away from water between 8 and 30 meters (100 ft) ☐ Not applicable

2. If primary contact recreation activities are not observed, describe the physical characteristics of the water body that may hinder the frequency of primary contact (depth, etc.) (Attach photos, etc. for documentation).

3. Describe if there is public access (e.g., parks, roads, etc.) (Attach photos, maps, etc. for documentation).

4. Is an area with primary contact recreation activities or a bathing beach (e.g., state/local parks with swimming, etc.) located near (e.g., within 5 miles upstream and downstream) this site?

C. Secondary Contact Water Recreation Evaluation:

- Secondary contact recreation 1: Water recreation activities, such as fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, not involving a significant risk of water ingestion and that commonly occur.
- Secondary contact recreation 2: Water recreation activities, such as fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, not involving a significant risk of water ingestion but that occur less frequently than for secondary contact recreation 1 due to (1) physical characteristics of the water body and/or (2) limited public access.

1. Were water recreation activities observed at the site, but the nature of the recreation does not involve a significant risk of ingestion (e.g., secondary contact recreation activities)? ☐ Yes ☐ No secondary contact recreation activities were observed.

- a. Check the following boxes of secondary contact recreation activities that were observed at the time of the sampling event at the site (Attach photos of activities or lack of activities).

- ☐ Fishing
☐ Boating-commercial, recreational
☐ Non-whitewater-kayaking, rafting, canoeing
☐ No secondary contact recreation activities were observed
☐ Other secondary contact activities: _____

Field Data Sheets – Basic RUAA Survey

Stream Name: _____ Site: _____
Date: _____ Time: _____

- b. Check the number of individuals observed at the site.
☐ None ☐ 1-10 ☐ 11-20 ☐ 20-50 ☐ greater than 50
- c. Check the following that apply regarding the individuals proximity to the water body.
☐ Secondary touch: fishing, pets and related contact with water
☐ In a boat touching water
☐ Body on shore near water within 8 meters (25ft) of water
☐ Body well away from water between 8 and 30 meters (100 ft)
2. If secondary contact recreation activities are not observed, describe the physical characteristics of the water body that may hinder the frequency of secondary contact (Attach photos, etc. for documentation).

3. If secondary contact recreation activities are observed, how often do water recreational activities occur that do not involve a significant risk of water ingestion? ☐ frequently ☐ infrequently
Please describe how often the activities occur? ☐ Unknown ☐ Never ☐ Daily ☐ Monthly ☐ Yearly
4. If infrequently, what is the reason?
☐ physical characteristics of the water body ☐ limited public access ☐ other
If other, list reasons: _____
5. Describe the physical characteristics of the water body that hinders the frequency of secondary contact recreation (depth, etc.) (Attach photos or depth measurements, etc. for documentation).

6. Describe why there is limited public access (e.g., lack of roads, river or stream banks overgrown, etc.) (Attach photos, maps, etc. for documentation).

D. Noncontact Recreation Evaluation

Noncontact recreation applies to water bodies where recreation activities do not involve a significant risk of water ingestion, and where primary and secondary contact recreation uses do not occur because of unsafe conditions, such as barge traffic.

1. Provide site-specific information and documentation (including photographs) regarding unsafe conditions, recreation activities, and presence or absence of water recreation activities.

Field Data Sheets – Basic RUAA Survey

Stream Name: _____ Site: _____
Date: _____ Time: _____

E. Stream Channel and Substantial Pools Measurements

Please check the following which best describes the river or stream: ☐ Wadeable ☐ Non-wadeable

1. Wadeable Streams

Determine whether or not the average depth at the thalweg is greater than 0.5 meters and if there are substantial pools with a depth of 1 meter or greater. Walk an approximately 300 meter reach (total) at the site and take the following measurements within the 300 meter reach. Measurements should be taken during base flow conditions (sustained or typical dry, warm-weather flows between rainfall events, excluding unusual antecedent conditions of drought or wet weather

Also, take photos facing upstream, downstream, left bank, and right bank at the 30 meters, 150 meters, and 300 meters.

Photos #s (30 meters) Upstream _____ Downstream _____ Left Bank _____ Right Bank _____
Photos #s (150 meters) Upstream _____ Downstream _____ Left Bank _____ Right Bank _____
Photos #s (300 meters) Upstream _____ Downstream _____ Left Bank _____ Right Bank _____

- a) Substantial pools - Measure the length of each pool (if > 10 pools only measure 10 pools), the width (at the widest point), and the deepest depth. A substantial pool is considered a pool greater than 10 meters in length for the purposes of a Basic RUAA Survey. If depth and/or width measurements were not attainable, explain why.

	Length (meters)	Width (meters)	Depth (meters)
Pool 1			
Pool 2			
Pool 3			
Pool 4			
Pool 5			
Pool 6			
Pool 7			
Pool 8			
Pool 9			
Pool 10			

- b) Average depth at the thalweg –Take depth measurements approximately every 30 meters to calculate an average depth at the thalweg (at least 10 measurements needed). If depth and/or width measurements were not attainable, explain why.

Distance	Depth (meters)
30 meters	
60 meters	
90 meters	
120 meters	
150 meters	
180 meters	
210 meters	
240 meters	
270 meters	
300 meters	
Average	

Field Data Sheets – Basic RUAA Survey

Stream Name: _____ Site: _____
Date: _____ Time: _____

- c) Stream width – Measure (1) the width at one point which represents the typical average width of the 300 meter reach; (2) the width at the narrowest point of the stream within the 300 meter reach; and (3) the width at the widest point of the stream within the 300 meter reach.

Measurement Type	Width (meters)
Typical Average Width of 300 meter reach	
Width at narrowest point of the stream within 300 meter reach	
Width at the widest point of the stream within 300 meter reach	

- d) Is there sufficient water within a 300 meter stream reach during base flow conditions to support primary contact recreation? ☐ Yes ☐ No

Comments: _____

2. Non-wadeable Streams

If accessible, take 10 width measurements which represent typical widths of the 300 meter reach. If the water is too deep and not accessible record the estimated average width of the water body.

Also, take photos facing upstream, downstream, left bank, and right bank at .

Photos #s (30 meters) Upstream _____ Downstream _____ Left Bank _____ Right Bank _____

Photos #s (150 meters) Upstream _____ Downstream _____ Left Bank _____ Right Bank _____

Photos #s (300 meters) Upstream _____ Downstream _____ Left Bank _____ Right Bank _____

# Measurements	Width (meters)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Field Data Sheets – Basic RUAA Survey

Stream Name: _____ Site: _____
Date: _____ Time: _____

F. Additional RUAA Information

1. Check the following activities observed over the site reach.

- | | |
|---|---|
| <input type="checkbox"/> Drinking or water in mouth | <input type="checkbox"/> Playing on shoreline |
| <input type="checkbox"/> Bathing | <input type="checkbox"/> Picnicking |
| <input type="checkbox"/> Walking | <input type="checkbox"/> Motorcycle/ATV |
| <input type="checkbox"/> Jogging/running | <input type="checkbox"/> Hunting/Trapping |
| <input type="checkbox"/> Bicycling | <input type="checkbox"/> Wildlife watching |
| <input type="checkbox"/> Standing | <input type="checkbox"/> None |
| <input type="checkbox"/> Sitting | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Lying down/sleeping | |

2. Are there permanent or long-term hydrologic modifications that are constructed and operated in a way that affects the recreational uses? ☐ Yes ☐ No (If yes, please provide supporting documentation and photos.)
Comments: _____

3. Check any channel obstructions that apply (Attach photos).

- | | | | | |
|---------------------------------------|---|---|--------------------------------------|--|
| <input type="checkbox"/> Culverts | <input type="checkbox"/> Fences | <input type="checkbox"/> Log jams | <input type="checkbox"/> Rip rap | <input type="checkbox"/> Water control structure |
| <input type="checkbox"/> Barbed wire | <input type="checkbox"/> Dams | <input type="checkbox"/> Thick vegetation | <input type="checkbox"/> Low bridges | <input type="checkbox"/> None |
| <input type="checkbox"/> Utility pipe | <input type="checkbox"/> Other (specify): _____ | | | |

4. Check all surrounding conditions that promote recreational activities (Attach photos of evidence or unusual items of interest).

- | | | | |
|--|---|---|--|
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> Stairs/walkway | <input type="checkbox"/> Roads (paved/unpaved) | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Playgrounds | <input type="checkbox"/> Boating access (ramps) | <input type="checkbox"/> Populated area | <input type="checkbox"/> None of the Above |
| <input type="checkbox"/> Rural area | <input type="checkbox"/> Beach | <input type="checkbox"/> Docks or rafts | |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Bridge crossing | <input type="checkbox"/> Commercial outfitter | |
| <input type="checkbox"/> National forests | <input type="checkbox"/> Commercial boating | <input type="checkbox"/> Nearby school | |
| <input type="checkbox"/> Urban/suburban location | <input type="checkbox"/> Trails/paths (hiking/biking) | <input type="checkbox"/> Power Line Corridor | |
| <input type="checkbox"/> Golf Course | <input type="checkbox"/> Paved parking lot | <input type="checkbox"/> Parks (national/city/county/state) | |
| <input type="checkbox"/> Sports Field | <input type="checkbox"/> Unimproved parking lot | <input type="checkbox"/> Public Property | |

Comments: _____

5. Check all surrounding conditions that impede recreational activities (Attach photos of evidence or unusual items of interest).

- | | | |
|---|--|---|
| <input type="checkbox"/> Private Property | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign |
| <input type="checkbox"/> Barge/ship traffic | <input type="checkbox"/> Wildlife | <input type="checkbox"/> Industrial |
| <input type="checkbox"/> Steep slopes | <input type="checkbox"/> None of the Above | <input type="checkbox"/> No public access |
| <input type="checkbox"/> Other: _____ | <input type="checkbox"/> No roads | |

Comments: _____

6. Check any indications of human use (Attach photos).

- | | | | |
|--|---|--|--|
| <input type="checkbox"/> Roads | <input type="checkbox"/> RV/ATV Tracks | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Organized event |
| <input type="checkbox"/> Rope swings | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Gates on corridor | <input type="checkbox"/> No Human Presence |
| <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> Children's toys | |
| <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Remnant's of Kid's play | |
| <input type="checkbox"/> Other: _____ | | | |

Comments: _____

Field Data Sheets – Basic RUAA Survey

Stream Name: _____ Site: _____
Date: _____ Time: _____

7. Check all water characteristics that apply (Attach photos).

Aquatic Vegetation: ☐ absent ☐ rare ☐ common ☐ abundant
Algae Cover: ☐ absent ☐ rare ☐ common ☐ abundant
Odor: ☐ none ☐ rare ☐ common ☐ abundant
Color: ☐ clear ☐ green ☐ red ☐ brown ☐ black
Bottom Deposit: ☐ sludge ☐ solids ☐ fine sediments ☐ none ☐ other
Water Surface: ☐ clear ☐ scum ☐ foam ☐ debris ☐ oil
Other: _____

8. Vertebrates Observed within 300 meter reach

Snakes ☐ None ☐ slight presence ☐ moderate presence ☐ large presence
Water Dependent Birds ☐ None ☐ slight presence ☐ moderate presence ☐ large presence
Alligators ☐ None ☐ slight presence ☐ moderate presence ☐ large presence
Comments: _____

9. Mammals Observed within 300 meter reach

Wild ☐ None ☐ slight presence ☐ moderate presence ☐ large presence
Domesticated Pets ☐ None ☐ slight presence ☐ moderate presence ☐ large presence
Livestock ☐ None ☐ slight presence ☐ moderate presence ☐ large presence
Feral Hogs ☐ None ☐ slight presence ☐ moderate presence ☐ large presence
Comments: _____

10. Evidence of wild animals or evidence of birds, cattle, hogs, etc.

☐ Tracks ☐ Fecal droppings ☐ Bird nests

11. Garbage Observed

Large garbage in the channel ☐ None ☐ Rare ☐ Common ☐ Abundant
Small garbage in the channel ☐ None ☐ Rare ☐ Common ☐ Abundant
Bank Garbage ☐ None ☐ Rare ☐ Common ☐ Abundant
Briefly describe the kinds of garbage observed:

12. Is the site located in a wildlife preserve with large wildlife (i.e., waterfowl) population? ☐ Yes ☐ No

13. Please document any other relevant information regarding recreational activities and the water body in general (for example, area outside of the stream reach evaluated).

Field Data Sheet - Basic RUAA Survey

Stream Flow (Discharge) Measurement

[illegible]

Comprehensive RUAA Interview Form

Stream Name: _____ Segment #: _____ Site: _____

Interviewer's Name: _____

Date & Time (include AM or PM): _____

Interviewed: ☐ In person ☐ By phone ☐ By mail

☐ No interviews were conducted

If no interviews were conducted, please provide an explanation:

*Are you willing to respond to a short survey about this stream? ☐ Yes ☐ No

If yes, complete contact information for the interviewee below. Do not collect name or contact information if interviewee is a minor. The contact information portion is not required if the interviewee does not want to provide this information.

Legal name: _____ Daytime phone number: _____

Mailing address: _____

Interviewee selected because (e.g., house adjacent to stream; standing by stream, etc.)

Questions:

1. Are you familiar with this stream? ☐ Yes ☐ No If yes, how many years? _____
If yes, proceed to #2. If no, stop here and do not conduct an interview.

2. Describe the location(s) of the stream reach the interviewee is familiar with:

3. Have the interviewer characterize the stream flow. Since the interviewer may not be familiar with TCEQ's definitions or distinction between the different water bodies, please refer to the definitions listed below when asking this question.

☐ Ephemeral: A stream which flows only during or immediately after a rainfall event, and contains no refuge pools capable of sustaining a viable community of aquatic organisms.

☐ Intermittent: A stream which has a period of zero flow for at least one week during most years. Where flow records are available, a stream with a 7Q2 flow of less than 0.1 cubic feet per second is considered intermittent. (Channel contains flowing water for only a portion of the year and surface water may be absent at times.)

☐ Intermittent w/ perennial pools: An intermittent stream which maintains persistent pools even when flow in the stream is less than 0.1 cubic feet per second. (When not flowing, the water may remain in isolated pools.)

☐ Perennial: A stream which flows continuously throughout the year. Perennial streams have 7Q2 equal to or greater than 0.1 cubic feet per second.

4. Have you or your family personally used the stream for recreation? ☐ Yes ☐ No
If yes, proceed to #6. If no, proceed to #5.

5. a. List reasons stream not used.

b. Proceed to #7.

Comprehensive RUAA Interview Form

Stream Name: _____ Segment #: _____ Site: _____

6. How do you use the stream? When did these uses occur (e.g., year(s); season) and how often (times/year)?
What location did these uses occur (get specific location and mark on a map)?

☐ Swimming ☐ Skin Diving ☐ Water Skiing ☐ Wind surfing ☐ Hunting ☐ Wading-Adults
☐ Tubing ☐ Kayaking ☐ Rafting ☐ Trapping ☐ SCUBA diving
☐ Snorkeling ☐ Fishing ☐ Boating ☐ Canoeing ☐ Wading-Children

7. Have you observed others using this stream for recreation? ☐ Yes ☐ No
If yes, proceed to #8. If no, proceed to #9.

8. What kinds of uses have you witnessed? When did you witness these uses occurring (e.g., year(s); season) and how often (times/year)? What location did these uses occur (get specific location and mark on a map)?

☐ Swimming ☐ Skin Diving ☐ Water Skiing ☐ Wind surfing ☐ Hunting ☐ Wading-Adults
☐ Tubing ☐ Kayaking ☐ Rafting ☐ Trapping ☐ SCUBA diving
☐ Snorkeling ☐ Fishing ☐ Boating ☐ Canoeing ☐ Wading-Children

9. Have you heard about anyone using this stream for recreation? ☐ Yes ☐ No
If yes, proceed to #10. If no, conclude the interview.

10. What kind of uses have you heard about? When did you hear that these uses occur (e.g., year(s); season) and how often (times/year)? What location did these uses occur (get specific location and mark on a map)?

☐ Swimming ☐ Skin Diving ☐ Water Skiing ☐ Wind surfing ☐ Hunting ☐ Wading-Adults
☐ Tubing ☐ Kayaking ☐ Rafting ☐ Trapping ☐ SCUBA diving
☐ Snorkeling ☐ Fishing ☐ Boating ☐ Canoeing ☐ Wading-Children

11. Can you recommend someone else we could contact that knows the stream? ☐ Yes ☐ No
If yes, list person's contact information:

12. Additional comments (from the interviewee or interviewer):

RUAA Summary
(Not part of the Field Data Sheet)

This form should be filled out after RUAA data collection is completed. Use the Contact Information Form, Field Data Sheets from all sites, Interview Forms from all interviews conducted, Historical Information Review, and other relevant information to answer the following questions on the water body.

Name of waterbody: _____
Segment # or Nearest Downstream Segment #: _____
Classified Segment?: _____
County: _____

1. Observations on Use

- a. Do primary contact recreation activities occur on the water body?
☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown
- b. Do secondary contact recreation 1 activities occur on the water body?
☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown
- c. Do secondary contact recreation 2 activities occur on the water body?
☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown
- d. Do noncontact recreation activities occur on the water body?
☐ frequently ☐ seldom ☐ not observed or reported ☐ unknown

2. Physical Characteristics of waterbody

- a. What is the average thalweg depth? _____ meters
- b. Are there substantial pools deeper than 1 meter? ☐ yes ☐ no
- c. What is the general level of public access?
☐ easy ☐ moderate ☐ very limited

3. Hydrological Conditions (Based on Palmer Drought Severity Index)

- ☐ Mild-Extreme Drought ☐ Incipient dry spell ☐ Near Normal
- ☐ Incipient wet spell ☐ Mild-Extreme Wet